

EXHIBIT K

DICTIONARY OF COMPUTING

FOURTH EDITION



OXFORD

Dictionary of Computing

Fourth Edition

Oxford New York Tokyo
OXFORD UNIVERSITY PRESS
1996

CONTROL FLOW

programming was well suited to the control of the complex sequences of register transfers required by CISC instruction sets. Contemporary RISC processors with their emphasis on the rapid execution of simple instruction sets usually employ random logic control to optimize performance.

control flow The sequence of execution of statements in a program.

control-flow graph A *directed graph representing the sequence of execution in a program unit, in which nodes represent branching points or subprogram calls in a program, and arcs represent linear sequences of code. From the control-flow graph an analysis can show

- the structure of the program,
- starts and ends of program segments,
- unreachable code and dynamic halts,
- branches from within loops,
- entry and exit points for loops,
- paths through the program.

See also static analysis.

control key *See* keyboard, control character.

controlled sharing Making used resources available to more than one using resource through an *access control mechanism.

controller A subsystem that governs the functions of attached devices but generally does not change the meaning of the data that may pass through it. The attached devices are usually peripherals or communication channels. One of the functions of the controller may involve processing the data stream in order to format it for transmission or recording.

control line A conductor in a multiwire interface that conveys a control signal.

control memory Another name for microprogram store.

control points Points used in the specification of curves to define the general required shape.

control record A record that contains *control totals* derived by summing values from other records in a file. The totals may or may not have some sensible meaning. Their purpose is to check that none of the preceding records

has been lost or altered in some way. *See also* hash total.

control sequence A string of characters used to control the operation of a peripheral device. The composition of these strings is defined in ISO 6429. This standard does allow latitude for manufacturers to define proprietary sequences for specific purposes, and many such sequences are in use; 7-bit and 8-bit versions of the *control characters are defined. An earlier standard widely used in the US is ANSI X3.64. *See also* escape sequence.

control stack A stack mechanism that contains an instruction sequence. It is part of the control unit in a computer with stack architecture. *See* stack processing.

control structure A syntactic form in a language to express flow of control. Common control structures are

if...then...else, while...do,
repeat...until, and case.

control total *See* control record.

control unit (CU) The portion of a *central processor that contains the necessary *registers, *counters, and other elements to provide the functionality required to control the movement of information between the memory, the *ALU, and other portions of the machine.

In the simplest form of the classical von Neumann architecture, the control unit contains a *program counter, an *address register, and a register that contains and decodes the *operation code. The latter two registers are sometimes jointly called the *instruction register*. This control unit then operates in a two-step *fetch-execute* cycle. In the fetch step the instruction is obtained (fetched) from memory and the decoder determines the nature of the instruction. If it is a *memory reference instruction the execute step carries out the necessary operation(s) and memory reference(s). In some cases, e.g. a *nonmemory reference instruction, there may be no execute step. When the instruction calls for *indirect addressing, an additional step, usually called "defer", is required to obtain the indirect address from the memory. The last action during the execute step is to incre-